

CLAIMS

1. A method for performing red eye correction in an image, comprising:
providing a digital image;
identifying a red eye region in the digital image; and
applying a color correction to each pixel in the identified red eye region,
wherein the method for performing red eye correction in the image is automatic, requiring no input from a user to identify the red eye region, and to apply the color correction.
2. The method for performing red eye correction in an image as recited in claim 1, further comprising defining the digital image in a hue-saturation-intensity (HSI) color space, wherein each dimension of hue, saturation, and intensity is scaled to be defined by a segment having coordinates [0.0; 1.0].
3. The method for performing red eye correction in an image as recited in claim 2, wherein the identifying of the red eye region in the digital image includes determining whether any pixel in the digital image falls within a defined hue segment in the HSI color space.
4. The method for performing red eye correction in an image as recited in claim 3 wherein the defined hue segment is within a hue spectrum defined by the coordinates [0.0; 1.0], and the defined hue segment is within one of [0.0; 0.0694] and [0.9167; 1.0].
5. The method for performing red eye correction in an image as recited in claim 2, wherein the identifying of the red eye region in the digital image includes determining whether any pixel in the digital image falls within a defined region of saturation and intensity in the HSI color space.

6. The method for performing red eye correction in an image as recited in claim 5, wherein the defined region of the HSI color space is within an area on a plot of saturation verses intensity, the area being defined as greater than or equal to a polyline on the plot of saturation verses intensity defined by coordinates including [0.0; 1.0], [0.5; 1.0], [0.55; 0.34], and [1.0; 0.3].

7. The method for performing red eye correction in an image as recited in claim 2, further comprising applying a filter to the identified red eye region.

8. The method for performing red eye correction in an image as recited in claim 7, wherein the applying the filter to the identified red eye region includes applying at least one of a size filter, a shape filter, a color weight filter, a brightness dispersion filter, and a spectral criteria filter.

9. The method for performing red eye correction in an image as recited in claim 2, wherein the identifying of the red eye region in the digital image includes calculating an arithmetic average for each of hue, saturation, and intensity for each pixel within a defined red eye region, the defined red eye region satisfying criteria for hue, saturation, and intensity.

10. The method for performing red eye correction in an image as recited in claim 2, further comprising:

identifying a virtual weight center for the identified red eye region in the digital image;

and

identifying a real color center for the identified red eye region in the digital image,

wherein the virtual weight center is determined using a pixel's corresponding coordinates in a plot of saturation verses intensity in the HSI color space, and the real color center is defined as at least one pixel of all pixels within the identified red eye region with an HSI value closest to an arithmetic average of HSI values for all pixels within the identified red eye region.

11. A method for performing red eye correction in a digital image, comprising:

identifying red areas in the digital image;

filtering out non-red-eye red areas from the identified red areas, the filtering including the disregarding of areas too large for red eye effect, areas of an inappropriate shape to have red eye; areas of insufficient color intensity; areas of insufficient brightness dispersion, and areas failing to match a pre-determined spectral criteria;

defining a region having red eye effect; and

applying a color correction to the defined region,

wherein the method is performed automatically and without user input to define and to correct the region having red eye effect.

12. The method of claim 11, wherein the digital image is defined in a hue-saturation-intensity (HSI) color space, each of the dimensions of hue, saturation, and intensity being scaled to a segment bounded by coordinates [0.0; 1.0].

13. The method of claim 12, wherein the identifying the red areas in the digital image includes:

identifying hard red areas according to HSI criteria;

calculating arithmetic averages for each of hue, saturation, and intensity values for each pixel within the identified hard red areas;

identifying a virtual weight center for the identified hard red areas; and

identifying a real color center for the identified hard red areas, the real color center being defined as at least one pixel defining a point within the identified hard red area, the at least one pixel having values for hue, saturation, and intensity closest of all pixels within the hard red area to the arithmetic averages of all pixels within the hard red area for hue, saturation, and intensity.

14. The method of claim 11, wherein the applying of the color correction includes manipulation of saturation and intensity of pixels within the defined region.

15. The method of claim 11, wherein the applying of the color correction includes manipulating the hue, saturation, and intensity of pixels within the defined region to match a hue, saturation, and intensity of an identified true eye color.

16. Computer readable media having program instructions for removal of red eye effect in a digital image, the computer readable media comprising:

program instructions for automatically defining a region of the digital image having red eye effect; and

program instructions for automatically applying a color correction to the defined region,

wherein user input is not required to define the region of the digital image having red eye effect and user input is not required to apply the color correction to the defined region.

17. The computer readable media of claim 16, further comprising:

program instructions for defining the digital image in a hue-saturation-intensity (HSI) color space; and

program instructions for scaling each dimension of hue, saturation, and intensity in the HSI color space to a segment bounded by coordinates [0.0; 1.0],

wherein the automatically defining a region of the digital image having red eye effect uses HSI criteria.

18. The computer readable media of claim 16, further comprising:

program instructions for filtering the automatically defined region of the digital image having red eye effect, the filtering including filters for areas too large for red eye effect, areas of an inappropriate shape to have red eye; areas of insufficient color intensity; areas of insufficient brightness dispersion, and areas failing to match a pre-determined spectral criteria.

19. The computer readable media of claim 16, wherein the program instructions for automatically applying a color correction to the defined region include instructions to manipulate saturation and intensity of pixels within the defined region.

20. The computer readable media of claim 16, wherein the program instructions for automatically applying a color correction to the defined region include instructions to manipulate hue, saturation, and intensity of pixels within the defined region to match the hue, saturation, and intensity of an identified true eye color in the digital image.